Trend Study 13A-5-99

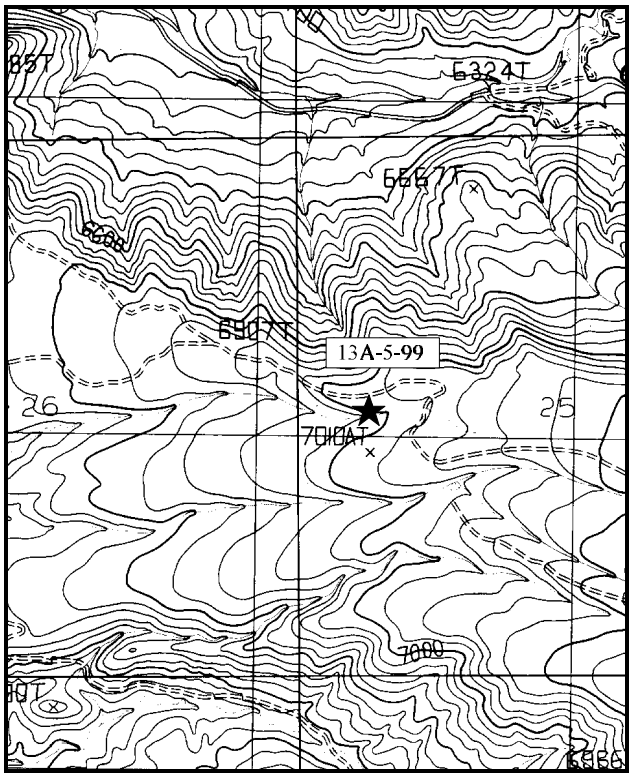
Study site name: Amasas Back . Range type: Chained, Seeded P-J .

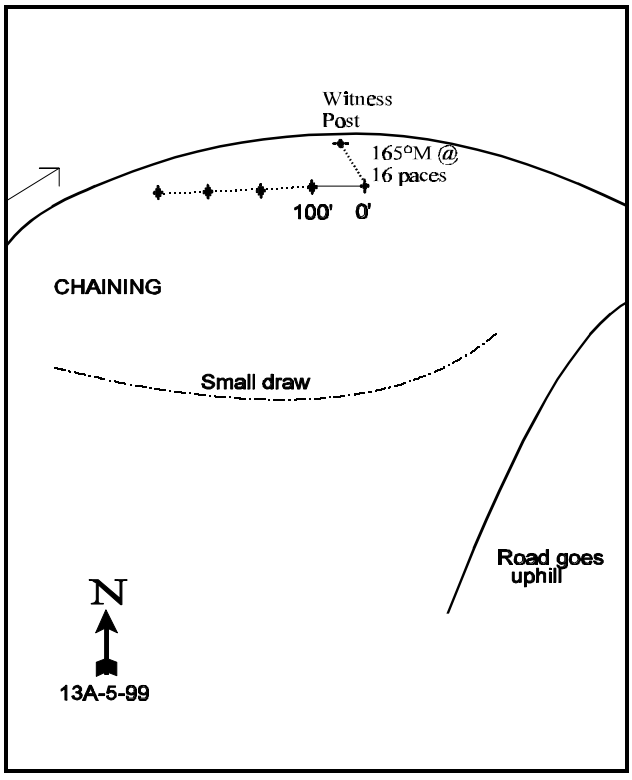
Compass bearing: frequency baseline 255°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Traveling south on SR 191 out of Moab, turn east off the highway onto a dirt road just past mile marker 114. Cross the cattleguard and stay right, continuing on the main road for 0.7 miles to a fence. Continue 1.3 miles to a fork. Stay left and go 0.4 miles to another fence. Continue 1.0 miles to a fork. Stay left, go 1.2 miles to the Forest Service boundary cattleguard. Cross the cattleguard and continue 1.5 miles to a witness post. The o foot stake is 16 paces from the witness post at a bearing of 165°M. The 0-foot stake is marked by browse tag #7859.





Map Name: Mount Tukuhnikivatz Diagrammatic Sketch

Township 27S , Range 23E , Section 25 UTM 4254124.026 N, 644396.348 E

DISCUSSION

Trend Study No. 13A-5 (33-5)

The Amasas Back study site is another area of critical big game winter range on the west side of the LaSal mountains. This can be illustrated by the pellet group transects done on the site in 1999 which showed 34 deer days use/acre (84 ddu/ha) and 54 elk days use/acre (133 edu/ha). This study samples a 750 acre chaining and seeding project that was completed in 1978 on the lower elevational limits of Forest Service administered land. The site demonstrates moderate encroachment of pinyon and juniper which has initiated some discussion and planning for future treatment with a roller-chopper. Point quarter data from 1994 and 1999 show densities that are almost the same with estimates of 89 trees/acre for pinyon and 104 trees/acre for juniper. Average diameter of juniper was 3.8 inches while that of pinyon was 2.3 inches. The study is located at an elevation of about 7,000 feet on a moderately sloping (5-8%) hillside facing south into a dry wash and an untreated pinyon-juniper woodland type.

The soil is a very rocky, sandy clay loam with rocks on the surface ranging in size from small to good sized boulders that have been left on the surface from past erosion. The soil appears to be moderately shallow (effective rooting depth of less than 10 inches) as manifested by the dominance of the shallow-rooted species, black sagebrush. There are some areas showing some compaction and some soil loss on cattle trails, but overall there appears to be little current erosion. The site has a mildly alkaline soil (7.5 pH). Soil phosphorus could be a limiting factor with 7.5 ppm, where 10 ppm is considered necessary for normal plant development. Percent organic matter is average for sites in this area. Soil temperature could also be another limiting factor with a temperature of 65°F at about 10 inches. Winter annuals could be quite successful on this type of site with these warm soil temperatures.

Black sagebrush makes up 57% of the browse cover. The moderately dense, mostly mature population (74%) exhibits little sign of over utilization; although some are moderately hedged. Young plants have made up from 7% to 17% of the population in the past, now they represent 8% of the population. In the past, some of the mature plants showed signs of reduced vigor by the presence of chlorotic leaves, with the percentage of the population showing decadence being relatively stable (8-9%). Percent decadence has gone up to 18% in 1999. The biotic potential (proportion of seedlings to the population) has gone from 6% (1994) to zero (1999). The population has decreased from 2,720 plants/acre (1994) to currently where it is down to 2,020 plants/acre. Other desirable browse plants are limited to a few bitterbrush, green ephedra, and fourwing saltbush. The pinyon pine and juniper are becoming more dominant on the chaining where many plants are at the height of 8-10 feet.

The seeded wheatgrasses were more prevalent in the past, where now they only provide about one-fifth of the grass cover. They have all decreased nested frequency values, likely due to the extended drought coupled with spring livestock grazing. Cheatgrass contributed 74% of the grass cover in 1994. Currently, this value has decreased to 59%, however the sum of nested values indicate it has increased in abundance. Cover has decreased because of the drought. Perennial forb density and diversity is low. Eighteen species have been encountered through the years, but only eleven were sampled in 1999. Almost half of these were annuals. The only forb species found with fair cover in 1994 was rock goldenrod, thickleaf peavine, and timber poisonvetch. Currently, only rock goldenrod has fair cover. This one species makes up 68% of the total forb cover.

The prevalence of rocks on the surface accounts for the estimated 22% rock and pavement cover. The value has increased in 1999 to 26%. This value has been steadily increasing since 1987. The percentage of vegetative cover is fairly good. Litter cover, although there is abundant debris from the chaining, is composed mostly of cheatgrass and has decreased from 62% down to 42%. However, percent bare ground is only at 12% for 1994 and 1999.

1994 TREND ASSESSMENT

The soil trend is stable to slightly improved. There has been some loss of the liter cover, which would be expected with the extended drought, but percent bare ground has decreased to only 12%. The browse trend is stable to improving with an increased biotic potential and stable rate of decadence. There was a slight increase in those considered in poor vigor, but this will turn around with more normal precipitation patterns. The increase in the number of broom snakeweed found on the site is likely due to the larger sample size taken in 1994 which better estimates plants with a clumped or discontinuous distribution. The trend for the herbaceous understory is down, as the perennial grass species have greatly decreased nested frequency values and the perennial forb species have increased slightly, but they have cover values half that of the grasses.

TREND ASSESSMENT
soil - stable to slightly improved
browse - stable to improving
herbaceous understory - down with the extended drought

1999 TREND ASSESSMENT

The soil trend is considered stable. There has been some loss in litter cover since 1987, but it has been stable between 1994 and 1999. Percent bare soil has also remained about the same. The browse trend for the key species (black sagebrush) is down. In 1994, it provided 57% of the browse cover, now it has gone done to only 39%. Conversely, cover for pinyon and juniper has increased from 34% of the browse cover to now where it provides 57% of the cover. There were no dead plants noted in 1994, now the ratio of dead to live is 1:7 (13% dead). Percent decadence has also increased from 8% to 18%. All this change has occurred with mostly light to moderate use. The long-term drought and associated winter injury, coupled with shallow soils and moderately high soil temperatures have caused significant losses to this population. There was a slight increase in those considered in poor vigor, but this should turn around with more normal precipitation patterns. The increase in the number of broom snakeweed found on the site has actually decreased. The trend for the herbaceous understory is slightly down for the perennial grasses and forbs. The annual component of the herbaceous species fluctuated, however, one thing that is constant is that cheatgrass is increasing.

TREND ASSESSMENT
soil - stable
browse - down
herbaceous understory - continued down for perennial species with the extended drought

HERBACEOUS TRENDS --
Herd unit 13A, Study no: 5

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
G	Agropyron cristatum	94	65	83	39	25	36	2.66	3.08
G	Agropyron intermedium	b137	a48	a49	53	21	19	1.01	1.23
G	Bromus anomalus	b31	ab7	a-	16	2	-	.15	-
G	Bromus japonicus (a)	-	-	2	-	-	2	-	.01
G	Bromus tectorum (a)	-	317	333	-	94	98	16.43	9.10
G	Hilaria jamesii	a-	b13	b22	-	6	7	.13	.66
G	Oryzopsis hymenoides	56	30	24	22	14	14	1.12	.79

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	‰94	‰99
G	Poa fendleriana	36	26	19	17	13	9	.43	.24
G	Sitanion hystrix	$_{b}$64	$_{a}$33	$_{a}$16	28	17	7	.14	.17
Total for Annual Grasses		0	317	335	0	94	100	16.43	9.11
Total for Perennial Grasses		418	222	213	175	98	92	5.66	6.18
Total for Grasses		418	539	548	175	192	192	22.09	15.30
F	Arabis perennans	$_{b}$12	$_{ab}$6	$_{a}$-	7	2	-	.01	-
F	Astragalus convallarius	$_{a}$-	$_{b}$10	$_{b}$15	-	7	9	1.54	.43
F	Astragalus coltoni	2	3	2	1	2	2	.03	.01
F	Castilleja linariaefolia	-	3	-	-	2	-	.01	-
F	Cryptantha humilis	-	-	-	-	-	-	.00	-
F	Cymopterus spp.	-	-	1	-	-	1	-	.03
F	Descurainia pinnata (a)	-	5	2	-	2	1	.01	.00
F	Draba reptans (a)	-	$_{b}$61	$_{a}$3	-	29	2	.15	.03
F	Erigeron pumilus	3	-	-	1	-	-	-	-
F	Gilia spp. (a)	-	$_{b}$36	$_{a}$5	-	17	3	.08	.01
F	Lathyrus lanszwertii	$_{a}$2	$_{b}$81	$_{b}$56	1	37	28	2.56	.74
F	Lesquerella spp.	-	1	6	-	1	2	.00	.01
F	Machaeranthera canescens	5	3	-	2	1	-	.00	-
F	Microsteris gracilis (a)	-	$_{b}$46	$_{a}$5	-	24	3	.12	.01
F	Petradoria pumila	$_{a}$34	$_{b}$75	$_{b}$62	14	30	25	4.05	2.96
F	Phlox longifolia	$_{a}$-	$_{b}$7	$_{a}$-	-	4	-	.02	-
F	Ranunculus testiculatus (a)	-	$_{b}$6	$_{a}$-	-	3	-	.04	-
F	Sphaeralcea coccinea	$_{a}$-	$_{ab}$6	$_{b}$8	-	2	4	.41	.07
Total for Annual Forbs		0	154	15	0	75	9	0.40	0.07
Total for Perennial Forbs		58	195	150	26	88	71	8.67	4.26
Total for Forbs		58	349	165	26	163	80	9.07	4.33

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 13A, Study no: 5

Type	Species	Strip Frequency '94	Strip Frequency '99	Average Cover % '94	Average Cover % '99
B	Artemisia nova	48	47	10.10	7.46
B	Artemisia tridentata wyomingensis	0	1	-	-
B	Atriplex canescens	3	3	1.00	.76
B	Coryphantha vivipara arizonica	0	2	-	-
B	Ephedra viridis	3	2	-	-
B	Gutierrezia sarothrae	12	13	.50	.03
B	Juniperus osteosperma	0	11	4.92	7.59
B	Opuntia erinacea	1	0	.00	-
B	Pediocactus simpsonii	0	1	-	-
B	Pinus edulis	0	6	1.18	3.32
B	Yucca baccata baccata	0	0	-	-
Total for Browse		67	86	17.71	19.16

CANOPY COVER --
Herd unit 13A, Study no: 5

Species	Percent Cover '99
Juniperus osteosperma	1

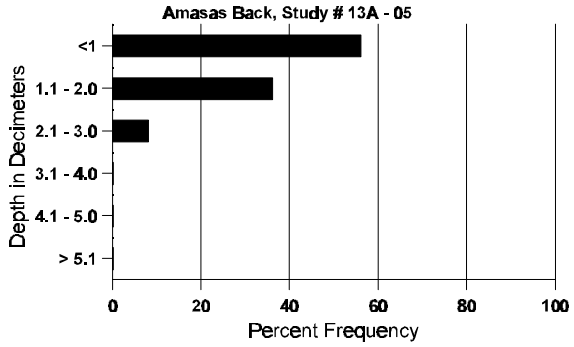
BASIC COVER --
Herd unit 13A, Study no: 5

Cover Type	Nested Frequency '94	Nested Frequency '99	Average Cover % '87	Average Cover % '94	Average Cover % '99
Vegetation	343	354	4.75	41.08	37.70
Rock	278	263	17.50	19.76	20.53
Pavement	201	201	1.25	1.53	5.09
Litter	377	371	61.50	42.43	42.45
Cryptogams	39	71	.50	.58	1.34
Bare Ground	225	230	14.50	12.41	12.25

SOIL ANALYSIS DATA --
Herd Unit 13A, Study # 05, Study Name: Amasas Back

Effective rooting depth (cm)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
9.7	65.0 (10.6)	7.5	50.9	19.8	29.3	3.5	7.5	96.0	0.6

Stoniness Index



PELLET GROUP DATA --
Herd unit 13A, Study no: 5

Type	Quadrat Frequency '94	Quadrat Frequency '99	Pellet Transect Days Use/Acre (ha) '99
Rabbit	9	20	N/A
Elk	7	20	54 (133)
Deer	13	23	34 (84)

BROWSE CHARACTERISTICS --
Herd unit 13A, Study no: 5

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia nova																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	9	3	-	-	-	-	-	-	-	10	1	1	-	400			12
	94	9	1	-	-	-	-	-	-	-	6	-	4	-	200			10
	99	5	3	-	-	-	-	-	-	-	7	-	1	-	160			8
M	87	38	12	1	1	-	-	-	-	-	44	2	6	-	1733	12	16	52
	94	87	25	-	3	-	-	-	-	-	93	-	22	-	2300	18	31	115
	99	44	25	5	1	-	-	-	-	-	75	-	-	-	1500	17	27	75
D	87	2	4	-	-	-	-	-	-	-	6	-	-	-	200			6
	94	5	2	2	-	2	-	-	-	-	6	-	3	2	220			11
	99	12	3	1	2	-	-	-	-	-	13	-	-	5	360			18
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	280			14

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	27%	01%	10%	+14%
'94	22%	01%	23%	-26%
'99	31%	06%	06%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:
	'87	2333	9%
	'94	2720	8%
	'99	2020	18%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	34	56	0
	99	-	2	-	-	-	-	-	-	-	2	-	-	-	40	30	34	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	100%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	40		-

Atriplex canescens																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	1	1	-	-	-	-	-	-	2	-	-	-	40			2
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	3	-	-	-	-	-	-	-	-	3	-	-	-	60	36	44	3
	99	-	2	-	-	-	-	-	-	-	2	-	-	-	40	34	40	2
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	1	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	60%	40%	00%

%Change

+20%

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	0%
	'94	80		0%
	'99	100		20%

Coryphantha vivipara arizonica																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	3	8	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	40		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Ephedra viridis																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	4	-	-	-	-	-	-	4	-	-	-	80	11	6	4
	99	1	-	1	-	-	-	-	-	-	2	-	-	-	40	19	23	2
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	80%	00%	-60%
'99	00%	50%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	100		-
	'99	40		-

Gutierrezia sarothrae																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
	99	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	21	-	-	-	-	-	-	-	-	21	-	-	-	420	8	11	21
	99	17	-	-	-	-	-	-	-	-	17	-	-	-	340	8	11	17
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	6	-	-	-	-	-	-	-	-	5	-	-	1	120			6
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	03%	-36%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	0%
	'94	660		18%
	'99	420		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	87	3	-	-	-	-	-	-	-	-	3	-	-	-	100	46	31	3
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	7	-	-	-	-	-	-	1	-	8	-	-	-	160	-	-	8
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	100	Dec:	-
	'94	0		-
	'99	220		-

Opuntia erinacea																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	1	-	-	-	-	-	-	-	-	-	-	1	-	20	2	4	1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	5	15	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	100%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	20		-
	'99	0		-

Pediocactus simpsonii																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	1	-	-	-	-	-	1	-	-	-	20	1	3	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	40		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pinus edulis																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	3	-	-	-	-	-	4	-	-	-	80	-	-	4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	120		-

Purshia tridentata																		
M	87	-	1	-	-	-	-	-	-	-	1	-	-	-	33	5	11	1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	16	29	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	19	43	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	100%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	33	Dec:	-
	'94	0		-
	'99	0		-

Yucca baccata baccata																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	8	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	0		-